CLAIM 26. (new) The method of claim 24, wherein said object is located between an altitude of about 60,000 feet from the surface of the earth and about the surface of the earth.

CLAIM 27 (new) The method of claim 25, wherein said object is located between an altitude of about 60,000 feet from the surface of the earth and about the surface of the earth.

REMARKS

Minor corrections, as suggested by the Examiner, have been made to the specification and minor corrections to the drawings have been proposed. Claims 1 –23 are pending in the application. Applicant recognizes with appreciation that claims 7, 8, 15-17 and 23 have been objected to but are allowable. Claims 24-27 are newly added. No new matter is added.

Claims 2 and 23 have been amended as suggested by the Examiner to relieve the objection to informalities as to them. Therefore, reconsideration and allowance of claims 2 and 23 is respectfully requested.

Claims 23 stands rejected under 35 U.S.C. 112, second paragraph, as being allegedly indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner claims that it is unclear as to what is disposed within the pressure cell, the device itself or the thermal energy transmitting material. Claim 23 depends from Claim 22, which in turn depends from Claim 10. Furthermore, it will be recognized and appreciated that Claim 23 distinctly claims and particularly points out at least the subject matter depicted in Figure 22 of Applicant's application. In addition, Claim 23 has been amended to provide a definite relationship between the thermal energy transmitting material and the pressure cell and is now in condition for allowance. Therefore, reconsideration and allowance of Claim 23 is respectfully requested.

35 USC 103 (a) Rejections

Claims 1-6, 9-14, 18 and 22 stand rejected under 35 USC 103(a) as being unpatentable over Lemley (U.S. Patent 4,338,560). For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a prima facie case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). Establishing a prima facie case of obviousness requires that all elements of the invention be disclosed in the prior art. *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970).

Further, even assuming that all elements of an invention are disclosed in the prior art, an Examiner cannot establish obviousness by locating references that describe various aspects of a patent applicant's invention without also providing evidence of the motivating force which would have impelled one skilled in the art to do what the patent applicant has done. *Ex parte Levengood*, 28 U.S.P.Q. 1300 (Bd. Pat. App. Int. 1993). The references, when viewed by themselves and not in retrospect, must suggest the invention. *In Re Skoll*, 187 U.S.P.Q. 481 (C.C.P.A. 1975).

Neither Lemley nor the conversion of heat to electricity art as a whole provide a reason for one of ordinary skill in the art to modify Lemley in the manner required to meet independent Claims 1, 10, and 19. *In re Laskowski*, 871 F.2d 115, 117, 10 U.S.P.Q.2d 1397, 1398 (Fed. Cir. 1989) ("Although the Commissioner suggests that [the structure in the primary art reference] could readily be modified to form the [claimed] structure, '[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification' ") (citation omitted); *In re Stencel*, 828 F.2d 751, 755, 4 U.S.P.Q.2d 1071, 1073 (Fed. Cir. 1987) (obviousness cannot be established "by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion that the combination be made"). There is no teaching or suggestions to combine elements of the prior art to produce the present invention. The present invention is thus nonobvious.

Applicant further maintains that the Examiner has used an improper standard in arriving at the rejection of the above claims under section 103, based on improper hind sight which fails to consider the totality of applicant's invention and to the totality of the cited reference. More specifically the Examiner has used Applicant's disclosure to select portions of the cited reference

to allegedly arrive at Applicant's invention. In doing so, the Examiner has failed to consider the teachings of the reference or Applicant's invention as a whole in contravention of section 103, including the disclosures of the reference which teach away from Applicant's invention.

> In applying Section 103, the U.S. Court of Appeals for the Federal Circuit has consistently held that one must consider both the invention and the prior art "as a whole", not from improper hindsight gained from consideration of the claimed invention. See, *Interconnect Planning Corp. v. Feil,* 227 U.S.P.Q. 543, 551 (Fed. Cir. 1985) and cases cited therein. According to the *Interconnect* court [n]ot only must the claimed invention as a whole be evaluated, but so also must the references as a whole, so that their teachings are applied in the context of their significance to a technician at the time - a technician without our knowledge of the solution.

Id. Also critical to this Section 103 analysis is that understanding of "particular results" achieved by the invention. *Id.*

When, as here, the Section 103 rejection was based on selective combination of the prior art reference to allegedly render a subsequent invention obvious, "there must be some reason for the combination other than the hind sight gleaned from the invention itself." *Id.* Stated in another way, "[i]t is impermissible to use the claimed invention as an instruction manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." *In re Fritch* 23 U.S.P.Q.2d 1780, 1784 (Fed. Cir. 1992).

Lemley teaches "a **heat-to-electricity** converter, particularly adaptable for use by **high-altitude** platforms such as aerostats and **space stations**, for changing heat energy of radiation from the earth to electric power during day and/or night." (Emphasis added.) See Abstract. "The invention relates generally to . . . converting the earth's albedo, that is infrared radiation of the earth, to direct current (dc) power . . . **for use by high-altitude platforms for propulsion, sensors, or other power requirements**." (Emphasis added.) Col. 1, lines 5-12. Lemley teaches that the earth's horizon at a high altitude, for example 22 kilometers (km) or 70,000 feet, is an attractive altitude for sensor operation. Col. 2, lines 39-41. This is contrary to objects located at the earth's surface or proximate thereto. Furthermore, 70,000 feet is more than double the altitudes that flying aircraft typically travel. Lemley does not teach or suggest arranging a

thermal energy transmitting material over an object . . . wherein said object includes objects on the surface of the earth and proximate thereto. Thus, it is respectfully submitted that Claim 1, and the claims depending from Claim 1, i.e., 2-9, 24 and 26, define over Lemley. It is further noted that the expected material of Lemley to provide the claimed properties in Claim 1 does not cure the deficiencies noted above in Lemley.

Moreover, because the device taught in Lemley is located tens of thousands of feet above the earth's surface, it does not teach thermal interaction by conduction, as Applicant teaches. (See Col. 2, lines 38-53). Furthermore, the device taught in Lemley teaches little, if any, convection heat transfer from the earth's surface and /or proximate thereto, to a distance located tens of thousands of feet away (i.e., 70,000 feet). Lemley primarily teaches radiation heat transfer from the earth's surface to a distance located tens of thousands of feet away (i.e., 70,000 feet) for converting this radiation to useful energy at such a high-altitude and discarding any heat energy to deep space. Applicant teaches converting thermal energy from conduction and/or convection energy transfer at the surface of the earth or proximate thereto into radiant thermal energy and transmitting the resulting radiant thermal energy via radiation heat transfer, away from the surface of the earth toward deep space. Lemley teaches a device to convert radiant energy received at a high-altitude to useful energy to sustain an object located at that high-altitude, primarily at night when solar energy is not available. Lemley does not teach a device that affects thermal energy on the surface of the earth or proximate thereto, as the Applicant does. Lemley teaches a different solution to a different problem.

As for Claim 10, which is similar to Claim 1, it is respectfully submitted that Lemley does not disclose, nor make obvious, a thermal energy transmitting material designed to cover an object and positioned with a transmitting surface thereof facing deep space, said transmitting material having spectral surface properties of high emissivity in a spectral band substantially transparent to the atmosphere of the earth, wherein said object includes objects on the surface of the earth and proximate thereto. As discussed above with respect to Claim 1, Lemley limits the energy conversion to high-altitude conversions (i.e., 70,000 feet above the earth's surface). More specifically, Lemley teaches a high-altitude converter of albedo radiation to electrical energy and heat energy for use primarily at night by an object at the same high-altitude. Lemley does not teach or suggest thermal energy transmitting material designed to cover an object on the surface

of the earth and proximate thereto. Again, Lemley teaches a different solution to a different problem. Thus, it is respectfully submitted that Claim 10, and the claims which depend from Claim 10, i.e., Claims 11-18, 22, 23, 25, and 27, define over Lemley. It is further noted that the expected material of Lemley to provide the claimed properties in Claim 10 does not cure the deficiencies noted above in Lemley.

Double Patenting Rejections

Claims 19-21 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 6 and 7 of U.S. Patent No. 6,162,985. Claims 19 and 20 have been amended from which Claim 21 depends. No new matter is added. Claims 19-21 define over Lemley for at least the same reasons indicated for Claims 1 and 10. Thus, it is respectfully submitted that Claims 19-21 are in a condition for allowance and request their allowance as such.

It is believed that the foregoing remarks fully comply with the Office Action. Therefore, having placed the claims in an allowable condition, reexamination and allowance of claims 1-27 are respectfully requested.

If there are any charges with respect to this amendment, or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicant's attorneys.

Respectfully submitted,
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Version with markings to show changes made.

A marked up version of the paragraphs of the first page follows:

Cross-Reference to Related Applications:

This application is a continuation-in-part application of U.S. Patent Application Serial No. 09/359,108 filed July 22, 1999, (now U.S. Patent No. 6,162,985), which is a continuation-in-part application of U.S. Patent Application Serial No. 08/933,789, filed September 19, 1997, (now U.S. Patent No. 5,936,193), which further claims the benefit of U.S. Provisional Application Serial No. 60/046,027 filed May 9, 1997, all of which are hereby incorporated herein by reference.

Background of Invention:

Field of the Invention

The present invention relates generally to the use of solar and thermal energy and more particularly to the radiation of thermal energy from the surface of the earth into deep space to alleviate the effects of global warming.

~~Prior~~Description of the Related Art

A marked up version of the paragraph replaced on page 36 follows:

In Figure 18, the p-type and n-type materials reside on thin film insulators 72 which enable the construction of light weight modules. In this embodiment, thin film technology is employed to manufacture the p-type and n-type materials by the deposition of the semiconductor on thin film insulators 72 that can be installed into the reduced pressure cell. This enables further snaking the p-n elements, laterally, longitudinally and otherwise, to increase the thermal resistance of the system and improve the cross-sectional area of the semiconductor material, hence improving the power generating capabilities of the vacuum pod. Various types of thin film insulators 72 can be employed, such as those having sufficient thermal insulation to inhibit adverse thermal effects between the elements. Possible insulators include glass, ceramic, thermoplastics, and thermoset materials, among others, combinations and composites thereof. The thickness of these films 72 should be sufficient to attain the

desired insulating effects, with a thickness up to about 30 mils or greater typically sufficient, below about 20 mils preferred, and up to about 10 mils especially preferred.

A marked up version of the paragraph replaced on page 24 follows:

In Figure 12, the reduced pressure cell 13' (as shown in Figures 9 and 10) further comprises an aperture ~~or window~~ 60. Aperture 60 is optionally configured as a window suitable for exchanging radiative energy therebeteen. This enables the junction surface 11 usage to also serve as a sink during daytime usage. If the thermoelectric generator 62 uses the daytime sky as a sink (normally shielded from the direct rays of the sun) then junction surface 11 is a sink in daylight usage and junction surface 12 is the source. Figure 21 further illustrates the window which forms the aperture 60 of the reduced pressure cell 13' to exchange radiative energy with a radiative source or sink. The radiative exchange area in the cell prefers line-of-sight contact with the sink (or source) energy exchange external body only, and hopefully no other bodies that will detrimentally influence the energy exchange. The size of the aperture can be larger, smaller, or substantially equivalent to the size of the radiative heat transfer area, with a size which maximizes the effectiveness of the radiative heat transfer area preferred.

In the Claims:

A marked up version of the claims follows:

CLAIM 1. (amended) A method for radiating thermal energy from a terrestrial position into deep space comprising:

arranging a thermal energy transmitting material over an ~~terrestrial~~ object; and,

positioning said thermal energy transmitting material so that a transmitting surface thereof faces deep space, said material having spectral surface properties of high emissivity in a spectral band substantially transparent to the atmosphere of the earth, wherein said object includes objects on the surface of the earth and proximate thereto.

CLAIM 2. (amended) The method of Claim 1 wherein said ~~terrestrial~~ object is covered with the transmitting material only at intervals during which the object is not in direct sunlight.

CLAIM 10. (amended) A device for transmitting thermal energy from an ~~terrestrial~~ object into deep space comprising:

a thermal energy transmitting material designed to cover an ~~terrestrial~~ object and positioned with a transmitting surface thereof facing deep space, said transmitting material having spectral surface properties of high emissivity in a spectral band substantially transparent to the atmosphere of the earth, wherein said object includes objects on the surface of the earth and proximate thereto.

CLAIM 19. (amended) An electricity generating device for use in an environment having an ambient pressure, ~~using an electricity generating cell~~ comprising:

a first junction surface in thermal~~disposed in~~ contact with one of deep space and solar energy~~a first semiconductor material~~;

a second junction surface ~~disposed~~ in thermal contact with an object located at about a surface of the earth or proximate thereto~~second semiconductor material~~;

~~a third junction surface disposed in contact with the first semiconductor material and the second semiconductor material;~~ and

an electricity generating cell intermediate the first and second junction surfaces;

wherein the first and second junction surfaces at a temperature different from each other ~~the third surface junction~~ producing a thermoelectric potential between the first and second junction surfaces.

CLAIM 20. (amended) The~~An~~ electricity generating device as set forth in claim 19, wherein the electricity generating cell has a thermal resistivity and further includes;

a~~the~~ first semiconductor material ~~is~~ disposed ~~in a distance~~ between the first junction surface and the second~~third~~ junction surface, ~~; and~~

~~———~~the first semiconductor material has a geometry which increases said thermal resistivity as compared to a second electricity generating cell having a first semiconductor material having a straight geometry which spans a substantially equivalent distance.

CLAIM 23. (amended) The device of Claim 22 wherein the heat transfer surface and at least a portion of the thermal energy transmitting material are disposed within a pressure cell having a pressure less than ambient pressure.

CLAIM 24. (new) The method of claim 1, wherein said object is located between about an altitude of flying aircraft and about the surface of the earth.

CLAIM 25. (new) The method of claim 10, wherein said object is located between about an altitude of flying aircraft and about the surface of the earth.

CLAIM 26. (new) The method of claim 24, wherein said object is located between an altitude of about 60,000 feet from the surface of the earth and about the surface of the earth.

CLAIM 27 (new) The method of claim 25, wherein said object is located between an altitude of about 60,000 feet from the surface of the earth and about the surface of the earth.